REMARKS/ARGUMENTS

Applicant respectfully submits that the outstanding rejections have been overcome, as detailed below.

Claims 1-4 and 6-9 stand rejected under 35 U.S.C. 102(b) as being anticipated by Raab (USPN 5,915,170). This rejection has been overcome by Applicants amendments and remarks.

Claim 1 has been amended to provide a method for applying adhesive for securing a printed circuit board to a substrate, the method comprising steps of: providing a first printing tool with a first plurality of apertures defined therethrough, *wherein a top of at least one aperature has a larger area than a bottom of the at least one aperature*; placing the first printing tool upon a surface of at least one of the printed circuit board and the substrate; printing a first liquid adhesive onto the surface through the first printing tool, the first liquid adhesive forming islands of adhesive within each aperture; removing the first printing tool perpendicularly from the surface such that the first printing tool deforms edges of the islands of the first adhesive to form a raised edge above an exposed major face of the adhesive at a periphery of an island *such that the smaller area of the bottom of the aperature assists in pulling adhesive material upwardly to form the raised edge around only a portion of a periphery of each island*; curing the first liquid adhesive; *placing a liner on top of the first adhesive, such that the liner contacts the raised edge of a plurality of islands; and removing the liner which includes residual adhesive, whereby the integrity of most of a major surface of the adhesive island is preserved before laminating the printed circuit board to the substrate.*

Raab does not disclose or suggest Applicant's invention as now recited in Amended Claim 1. Antecendent basis for Applicant's amendment is found in cancelled claim 5 and in the specification at page 4, lines 15-18.

Applicant's invention provides a cost effective, robust and repeatable multi-step method and technique to be able to use a dispensed liquid adhesive without causing significant damage to the adhesive. Further it provides a technique that can utilize low-cost release liners, such as common release liners or even plastic films, which can be easily peeled off without significantly affecting the adhesive bonding surface property of the adhesive.

To further explain Applicant's invention, the Examiner is respectfully directed to FIG. 7 and the specification. Advantageously, FIG. 7 shows the placement of the release liner 30 onto the raised edges 28 of the adhesive islands 16. The use of the release liner 30 is to provide protection of the adhesive during shipping and storage. The release liner can be of any standard coated release paper or even plastic film. The thickness of the release liner and the dimensions of the apertures are chosen such that the release liner will not slump between the raised edges of the adhesive and touch the top surface of each island. Since the placement pressure is low, the contact area of the release liner is only on top of the small raised edges, making removal of the liner very easy due to the small amount of bonding force, and resulting in little damage to the adhesive.

Now referring to FIG. 8, Applicant shows the peeling away of the release paper. Due to the nature of the silicone-based adhesive and coated release paper or plastic film, it is envisioned that the raised edges may become bonded to the release liner. In this case, upon removal of the liner 30 the raised edges 28 could be ripped off of the islands 16 leaving residual adhesive 32 on the release paper. The innovation of using the raised edges preserves the integrity of most of the major surface of the adhesive islands 16 for subsequent bonding, which is in apposite to Raab.

In more detail, Raab is directed to a completely different process and in fact teaches away from Applicant's invention, by requiring adhesive pads 64 placed over the top 52 of the support pads 38. (See Column 9, lines 63 to Col. 10, line 13.) Raab does not disclose or suggest Applicant's invention, as recited in Amended Claims 1 and 10 or the advantages of providing a cost effective, robust, simple and repeatable multi-step method. Applicant's invention, as recited in Claim 1 and 10, is clearly not a mere design choice based on Raab. Applicant's dependent claims are similarly deemed allowable.

Accordingly, it is respectfully submitted that this rejection has been overcome.

Claim 5 stands rejected under 35 U.S.C. 103(a) as being unpatentable over Raab (USPN 5,915,170). This rejection has been rendered moot by Applicant's cancellation of this claim.

Claims 10-14 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Raab (USPN 5,915,170). This rejection has been overcome.

Applicant's remarks relative to Amended Claim 1 are incorporated herein by reference, to the extent applicable to Amended Claim 10. Dependent Claims 11-14 are likewise deemed allowable. Accordingly, Applicant respectfully submits that this rejection has been overcome.

In addition, in connection with Claim 14, such claim is completely different from Raab which teaches away from Applicant's invention, by requiring adhesive pads 64 placed over the top 52 of the support pads 38. (See Column 9, lines 63 to Col. 10, line 13.) Applicant's Claim 14 recites placement of the second thermally conductive adhesive onto the surface, which is not disclosed or suggested by Raab.

For a more detailed explanation, the Examiner is directed to FIG. 11 which shows the addition of such second thermally conductive adhesive 40 to the previous adhesive assembly. This second adhesive can be directly dispensed or used in the same manner as previously explained for FIGs. 2-10. In particular, a second printing tool with a second plurality of apertures defined therethrough can be provided. Optionally, the thermally conductive adhesive can be applied to one of the substrate and circuit board while the first silicone liquid adhesive can be applied to the other of the substrate and circuit board. Alternatively, the thermally conductive adhesive can be printed and cured before the application of the first liquid silicone adhesive.

Accordingly, it is respectfully submitted that this rejection has been overcome.

Applicant believes that the subject application, as amended, is in condition for allowance. Such action is earnestly solicited.

In the event that the Examiner deems the present application non-allowable, it is requested that the Examiner telephone Applicant's attorney or agent at the number indicated below so that the prosecution of the present case may be advanced by the clarification of any continuing rejection.

Please charge any fees that may be due to Deposit Account 503987, Temic Automotive of North America, Inc.

Respectfully submitted,

By: Gary J. Cunningham

Gary J. Cunningham
Attorney of Record
Reg. No.: 33,488

Telephone: 847-862-0270
Fax No.: 847-862-8308

SEND CORRESPONDENCE TO:

Continental Automotive Systems
Temic Automotive of North America, Inc.
21440 W. Lake Cook Road
Patents & Licenses, 7th Floor
Deer Park, IL 60010
Customer Number: 64588